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Natural enemies of bean leaf beetle

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INTEGRATED CROP MANAGEMENT

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Bean leaf beetles have grabbed the attention of many soybean producers and field agronomists across Iowa this spring. Rayda Krell and Jeff Bradshaw in the Department of Entomology swept alfalfa near Ames the last week of May and collected 725 beetles in 50 sweeps. Beetle counts also have been very high in some soybean fields and insecticides have been widely used to manage the populations. I have received questions about alternate methods of insect pest management. During the past winter, I spoke to several soybean farmers that were going to delay planting as a cultural method of reducing the impact of this pest.

Bean leaf beetles feeding on soybean seedling in May 2002.

Enlarge [1]

There also has been some discussion on natural enemies of bean leaf beetles. It is a misconception that the bean leaf beetle is one of the few insect pests lacking any predators, parasites, or pathogens in the Midwest. In fact, research conducted at several universities in midwestern and southern states shows that the bean leaf beetle is attacked by parasitic mites, flies, and pathogenic diseases. A summary of this research is presented on the next page.

Iowa

A research team led by Larry Pedigo at Iowa State University found two species of external parasitic mites, *Trombidium*, on adult bean leaf beetles. Larval mites of both species were found under the wing covers where they attached with their mouthparts to the soft tissue between the abdominal segments. Mites parasitized both sexes of beetles but primarily attacked females. Parasitism rates for both sexes combine were less than 5 percent in 1986 and less than 1 percent in 1987 and 1988. The study found that the most prevalent parasitism occurred among overwintering bean leaf beetles after spring emergence, but not until mid-June as beetle populations began to decline. Parasitism rates for first-generation beetles were consistently less than for ovewintered beetles. Second-generation beetles (mid-August and later) were not parasitized by the mites. Parasitized beetles averaged two to three mites but sometimes hosted as many as 36 mites.

Louisiana

Researchers at Louisiana State University found that 22 percent of overwintered beetles were attacked by tachinid flies. Parasitized beetles laid very few or no eggs; one beetle laid a maximum of five eggs.

Minnesota

In 1983, University of Minnesota entomologists found a tachinid fly parasitizing adult bean leaf beetles at the Rosemount Experiment Station in the southern part of the state. They monitored two fields and found that the seasonal rate of parasitism fluctuated dramatically, reaching a maximum parasitism of 91 percent in one field but only 3 percent in a nearby field. The tachinid fly appeared to have four generations per year and the average parasitism of adult beetles was 17 percent throughout the summer. The researchers concluded that the parasitic fly larvae greatly reduced bean leaf beetle oviposition in one of the fields and that they were responsible for considerable mortality of overwintered beetles which resulted in a four-fold difference in the first generation of the beetle between the two study fields.

Nebraska

University of Nebraska entomologists found tachinid flies also parasitizing adult bean leaf beetles, but the rate of parasitism in east central Nebraska was very low, ranging from 0 to 1.1 percent. They also found *Trombidium* mites and the range of parasitism was 0-40 percent.

North Carolina

Two species of fungi, *Beauveria* and *Metarhizium*, attacked overwintered beetles in North Carolina. The highest incidence was 22 percent of the beetles infected by *Beauveria* during December while the beetles were in hibernation. Beetles also were attacked by tachinid fly larvae during the spring.

In summary, bean leaf beetle does host a small number of natural enemies in soybean fields, including those in Iowa. The rate of parasitism does fluctuate widely between no parastitism and very high levels. The value of these natural enemies may not be well understood, but their effects on reducing pest populations cannot be ignored. When natural enemies attack bean leaf beetles the population goes down and this helps in reducing potential economic damage to soybean.

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